



Organization and Activities of the Doctoral Program in Earth Evolution Sciences (Geological Sciences) for the Academic Year 2015

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Organization

During the year from April, 2015 to March, 2016, several promotions and appointments were made in the Doctoral Program in Earth Evolution Sciences (Geological Sciences) so that our research and teaching activities were enforced. All faculty and administrative staffs were (staffs with an asterisk * are belonging to the Doctoral Program in Integrative Environment and Biomass Sciences, but they are listed in our organization herewith, because they study geological sciences and have lectures on geological sciences for undergraduate students):

Professor:

Arakawa, Yoji, D. Sc., petrology, geochemistry and geochronology
Hayashi, Ken-ichiro, D. Sc., migration of heavy metals, geochemistry of hydrothermal system
Hisada, Ken-ichiro, D. Sc., stratigraphy, sedimentology
Sashida, Katsuo, D. Sc., Paleozoic and Mesozoic biostratigraphy
Tsunogae, Toshiaki, Ph.D. (Sc.), metamorphic petrology and crustal evolution

Associate Professors:

Agematsu, Sachiko, Ph.D. (Sc.), paleontology
Enescu, Bogdan, Ph.D. (Sc.), seismology, structural geology
Kamata, Yoshihito, Ph. D. (Sc.), stratigraphy, tectonics
Ujiiie, Kotaro, Ph.D. (Sc.), structural geology
Yagi, Yuji, Ph.D. (Sc.), seismology, structural geology
*Maruoka, Teruyuki, Ph.D. (Sc.), geochemistry

Assistant Professor:

*Anma, Ryo, Ph.D., structural geology and tectonics
Fujino, Shigehiro, Ph.D. (Sc.), sedimentology, stratigraphy, paleoseismology
Ikehata, Kei, Ph.D. (Sc.), petrology, resource geology
Komuro, Kosei, D. Sc., ore geology and geochemistry
Kurosawa, Masanori, Ph.D. (Sc.), mineralogy and geochemistry
Kyono, Atushi, Ph.D. (Sc.), structural physics of minerals

Cooperative Graduate School System

Professor:

Naoki Kohno, D. Sc., mammalian paleontology (National Science Museum)
Yasunari Shigeta, D. Sc., ammonite paleontology (National Science Museum)

Associate professor

Yasuyuki Tsutsumi, Ph.D. (Sc.), absolute dating (National Science Museum)

Research and Teaching Assistants:

Miyamoto, Makoto
Otani, Satoshi, B.A.
Ozaki, Shiro
Shimizu, Masahiro
Watase, Koichi, B.A.

Administrative Staff:

Isaka, Kyoko
Yasuda, Yoko

Doctor and Master's Theses

The following doctor and master's theses were completed during the academic year 2015 under the supervision of the members of the Doctoral Program in Earth Evolution Sciences.

Doctor of Philosophy (Science or Geosciences)

Shinozaki, Tetsuya (2016): Organic and Inorganic Geochemical Signatures Associated with the 2011 Tohoku-oki Tsunami.

Master of Science or Geoscience

Asato, Kaito (2016): Shell Morphology, Growth Pattern, and Life Position of *Shikamaia akasakaensis* Ozaki (Alatoconchidae; Bivalve) from the Permian Akasaka Limestone, Gifu Prefecture, Japan.
Chida, Kousuke (2016): Geochemical Characteristics of Hydrothermal Native Copper in Volcanic Rocks.
Endo, Suguru (2016): The 2013 Sea of Okhotsk Deep Earthquake: A Complex Rupture Within the Spinel Stability Zone.
Hiramoto, Jun (2016): The Oldest Oceanic Dolphin

(Delphinidae) Suggests Their Early Divergence in the North Pacific.

Kato, Masato (2016): High-pressure Raman Spectroscopic Studies of Hydrogarnet, Katoite $\text{Ca}_3\text{Al}_2(\text{O}_4\text{H}_4)_3$.

Kobayashi, Tsubasa (2016): Taxonomic Reconstruction of *Heterocyathus japonicus*.

Komoro, Takuya (2016): Investigation of Seismic Fault of the 1751 Horeki Echigo- Takada Earthquake.

Mitsuhashi, Shunsuke (2016): Paleothermal Structure of the Shimanto Accretionary Prism Distributed in Shishikui Area, Eastern Shikoku, Southwest Japan.

Muraoka, Hideki (2016): Mesozoic Sediments of the Yunishigawa and Hinoemata Areas, Tochigi and Fukushima Prefectures, Central Japan.

Okuwaki, Ryo (2016): Rupture Process and High-frequency Region, Related to the Complex Fault Geometry and Variable Slip Motions: the Mw 7.9 2008 Wenchuan, China, Earthquake.

Oktory, Prambada (2016): Eruptive History of Sundoro Volcano, Central Java, Indonesia in the Last 30 Ka.

Shirai, Ryo (2016): Simultaneous Determination of the Hypocenter and the High- frequency Excitation Region.

Tabata, Hiroki (2016): Detection of Past Frictional Heating on Fault Using Raman Spectra of Carbonaceous Material.

Tamura, Tomoya (2016): Bacterial Effect of Mineral Dissolution and Reprecipitation.

Tatezumi, Yuichi (2016): Conodont Biostratigraphy of the Uppermost Permian to Upper Triassic Limestone Distributed in the Takachiho Town of Miyazaki Prefecture, Kyushu, Japan

Yamagami, Yuta (2016): Investigating the Relationship Between Slow-slip Events and Tremor in SW Japan.

Yokooji, Miho (2016): Effect of Temperature and Pressure on the Structural Change of Diatom's Frustule.

Master of Arts in Education

Fujino, Miki (2016): Microfossils from the Narita Group, Central Japan.

Kato, Yuta (2016): Geostory for Mt. Tsukuba Area Geopark in Plan.

Kazami, Sou (2016): Petrology and Geochemistry of Metagabbro from Akarui Point in the Lützow-Holm Complex, East Antarctica.

Kokubo, Keiichi (2016): Study on Geoscience Teaching Material Using Local Subject Matter "Coal".

Research Activities

Each researcher had the following research activities during the academic year 2015.

Research projects

Agematsu, S. (2014~): Reconstruction of the Triassic conodont apparatuses.

Agematsu, S. (2015~): Ordovician to Silurian microfossils and paleoenvironments in Thailand and Malaysia.

Arakawa, Y. (2012~): Geological and petrological study of Aso volcano, Kyushu, Japan.

Arakawa, Y. (2014~): Mineralogical and petrological studies of anorthite megacrysts in arc volcanic rocks.

Arakawa, Y. (2014~): Petrological and geochemical investigations of volcanic rocks in Izu-volcanic arc, central Japan.

Enescu, B. (2015~): Dynamic triggering of earthquakes: systematic observations, mechanisms and modeling.

Enescu, B. (2009~): Modeling and forecasting of seismicity on the Japanese Islands.

Enescu, B. (2013~): Slow slip and aseismic deformation in subduction zones (with the group of Prof. D. Marsan, University of Savoie, France)

Enescu, B. (2013~): Statistical modeling of seismicity (with the Research Group of Professor J. Zhuang, ISM)

Enescu, B. (2012~): Mapping of the frequency-magnitude distribution of earthquakes along the Japanese subduction zones – implications for the occurrence of megathrust events. (with the Research Group of Prof. S. Wiemer, Swiss Federal Institute of Technology, Zurich).

Fujino, S. (2007~): Stratigraphic records of past earthquakes and tsunamis along the Nankai Trough.

Fujino, S. (2014~): Potential risk of tsunamis generated at submarine active faults in western Japan.

Hisada, K. and Poshtkoohi, M. (2012~): Tectonics of Middle East (Geology of Iran).

Hisada, K. and Charusiri, P. (2012~): Tectonics of Indochina (Geology of Thailand).

Ikehata, K. (2005~): Petrological and petrochemical studies of volcanic products from active volcano.

Ikehata, K. (2006~): Development of analytical methods for non-traditional (e. g., Cu, Fe, Zn) stable isotope ratios of materials and its applications to geochemical samples.

Kamata, Y. (2015~): Stratigraphy and tectonics of the

- Paleo-Tethys in Thailand and Lao.
- Kamata, Y. (2015~): Stratigraphy and tectonics of Jurassic accretionary complex in Japan.
- Komuro, K. (2013~): Geochemistry and formative environment of bedded manganese deposits in Japan.
- Komuro, K. (2015~): Tellurium and selenium mineralization in epithermal gold deposits.
- Kurosawa, K. (2015~): Single fluid-inclusion analysis using particle-induced X-ray emission (PIXIE) to elucidate chemical composition and behaviors of hydrothermal fluids from granites.
- Kurosawa, K. (2015~): Trace-element analysis of pegmatite and mantle minerals by using laser-ablation ICP-MS.
- Kyono, A. (2015~): Studies on a phase transition mechanism from ferrihydrite to hematite with compression, the effect of water on crystal structure and phase variation of the magnesium carbonate hydrate mineral, the carbon solubility into silica minerals under high-temperature, shock-induced phase transition of iron and aluminum metals, symmetry changes of analcime by formation conditions, and TEM investigation of the interaction between bacteria and mineral surfaces.
- Maruoka, T. (2009-2015): Geochemical study for understanding the environmental perturbations at the mass-extinction events.
- Sashida, K. (2015~): Paleozoic and Mesozoic paleoenvironmental studies in Thailand and peninsular Malaysia.
- Tsunogae, T. and Santosh, M. (2014~2018): Crustal evolution of the Gondwana suture zones in India and Sri Lanka.
- Tsunogae, T., Dunkley, D.J., and Miyamoto, T. (2014~2019): Pressure-temperature-time evolution of granulites in East Antarctica.
- Tsunogae, T. and Dubessy, J. (2009-2015): Characterization of fluids in high-temperature granulites: evidence from quantitative Raman spectroscopic study.
- Yagi, Y. (2012~): Seismic source process of large and great earthquakes derived from a hybrid back-projection and a waveform inversion.
- Yagi, Y. (2012~2015): Mega Quake Risk Management: A comprehensive approach towards mitigating earthquake-related disasters.
- ma. Grant-In-Aid for Scientific Research (C), JPY 900,000 for 2015.
- Fujino, S. (2011~2015): Stratigraphic records of past earthquakes and tsunamis along the Nankai Trough. Program to Disseminate Tenure Tracking System, JPY 15,000,000 for 2015.
- Hisada, K. (2012~2015): High-accuracy provenance study of clastics from Mesozoic accretionary complex on land, Grant-In-Aid for Scientific Research (C), JPY 5,200,000.
- Hisada, K. (2012~2016): Ancient West Asian Civilization as the foundation of all modern civilizations: A counter to the Clash of Civilizations' theory. Grant-In-Aid for Scientific Research on Innovative Areas, 2012~2016, JPY 7,150,000.
- Ikehata, K. (2014~2016): Study on formation mechanism of submarine native copper deposits based on copper isotopic measurement. Grant-In-Aid for Young Scientists (B).
- Ikehata, K. (2015-2018): In-situ trace and isotopic ratio analysis for seafloor hydrothermal samples. Next-generation technology for ocean resources exploration for Cross-ministerial Strategic Innovation Promotion Program (SIP).
- Kamata, Y. (2015~2017): Seismogenic faults of the Jurassic accretionary complex in Japan. Grant-In-Aid for Scientific Research (C), JPY 1553,000
- Kurosawa, M. (2012~2016): The construction of databases for chemical compositions and textures of sherds and stone implements from archaeological sites in Western Asia. Grant-in-Aid for Scientific Research on Innovative areas.
- Kyono, A. (2014-2016) Structural changes of iron oxides with nanoparticulation. Grant-in-Aid for Scientific Research (C) from JSPS (project no. 26400511).
- Maruoka, T. (2015~): A multi-isotope approach to understanding paleo-environments in West Asia, Grant-in-Aid for Scientific Research on Innovative Areas (MEXT), ¥3,200,000
- Tsunogae, T. (2014~2017): Petrology of Archaean continental fragments in Neoproterozoic Gondwana collisional orogeny. Japan Society for the Promotion of Science: Basic Research (B), JPY 6,900,000
- Ujiie, K. (2016~2020): Science of slow earthquakes. Grant-in-Aid for Scientific Research on Innovative Area (Research in a proposed research area)

Research grants

- Arakawa, Y. (2013~2015): Precise determination of micro-inclusions within anorthite megacrysts in arc setting, and estimation of their parental mag-

Activity Reports for Academic Exchange and Cooperation

Chulalongkorn University, the Kingdom of Thailand

(1) Exchange of Researchers:

None

(2) Exchange of Graduate Students: Parisa Nimnate

(Tokubetsu Kenkyusei; AIEJ Short-term Student Exchange Program, 12 months from December 2015, Hisada, K.)

(3) Collaboration Research:

None